

Improving Consumption and Purchases of Healthier Foods in Retail Environments: A Systematic Review

Allison Karpyn, PhD

Kathleen McCallops, MS



Center for Research in
Education & Social Policy



CRESP



RIGOROUS RESEARCH TO IMPROVE LIVES

The **Center for Research in Education and Social Policy (CRESP)** within the College of Education and Human Development at the University of Delaware conducts rigorous research, program evaluation, and policy analysis to help practitioners, policymakers, and the researchers who collaborate with them better understand critical issues in education, community health, and human services. **Learn more about what we do.**



Review

Improving Consumption and Purchases of Healthier Foods in Retail Environments: A Systematic Review

Allison Karpyn ^{1,*} , Kathleen McCallops ¹ , Henry Wolgast ¹ and Karen Glanz ²

¹ Center for Research in Education and Social Policy, University of Delaware, Pearson Hall, 125 Academy Street, Newark, DE 19716, USA; kamcca@udel.edu (K.M.); hnyrwlg@udel.edu (H.W.)

² Perelman School of Medicine and School of Nursing, University of Pennsylvania, Philadelphia, 3400 Civic Center Blvd, PA 19104, USA; kglanz@pennmedicine.upenn.edu

* Correspondence: karpyn@udel.edu; Tel.: +1-302-831-6428

Received: 21 August 2020; Accepted: 10 October 2020; Published: 16 October 2020



Abstract: This review examines current research on manipulations of U.S. food retail environments to promote healthier food purchasing and consumption. Studies reviewed use marketing strategies defined as the 4Ps (product, price, placement, promotion) to examine results based on single- and multi-component interventions by study design, outcome, and which of the “Ps” was targeted. Nine electronic databases were searched for publications from 2010 to 2019, followed by forward and backward searches. Studies were included if the intervention was initiated by a researcher or retailer, conducted in-store, and manipulated the retail environment. Of the unique 596 studies initially identified, 64 studies met inclusion criteria. Findings show that 56 studies had at least one positive effect related to healthier food consumption or purchasing. Thirty studies used single-component interventions, while 34 were multi-component. Promotion was the most commonly utilized marketing strategy, while manipulating promotion, placement, and product was the most common for multi-component interventions. Only 14 of the 64 studies were experimental and included objective outcome data. Future research should emphasize rigorous designs and objective outcomes. Research is also needed to understand individual and additive effects of multi-component interventions on sales outcomes, substitution effects of healthy food purchases, and sustainability of impacts.

Keywords: food access; nutrition; healthier food; dietary behaviors; review; retail food environment; dietary intake

Karpyn, A., McCallops, K., Wolgast, H., & Glanz, K. (2020). Improving consumption and purchases of healthier foods in retail environments: A systematic review. *International Journal of Environmental Research and Public Health*, 17(20), 7524. <https://doi.org/10.3390/ijerph17207524>

Introduction and Current Trends



Center for Research in
Education & Social Policy

Purpose

This review seeks to update and build on prior reviews which terminate with studies published on or around 2010 by analyzing U.S.-specific interventions occurring within the past 10 years with the goal of examining the extent to which contemporary manipulations of U.S. food retail environments (e.g., grocery and supermarket) specifically intended to promote healthier food purchasing and consumption are effective.



Table 1: The Four P's of Marketing

PRODUCT	▪ Product mix
	▪ Quality and variety
	▪ Nutrition composition
	▪ Packaging (e.g. package design/color, illustrations, targeting specific groups, front-of-pack labeling, menu labeling, portion size)
PLACEMENT	▪ Location of products
	▪ General store lay out
	▪ Check-out aisles
	▪ End-of-aisle (end-cap) displays
	▪ Quantity of facings/shelf space and store layout
	▪ Eye-level (children's, women's, men's)
PRICE	▪ Coupons
	▪ Specials
	▪ Differential prices
	▪ Private label/store brands
PROMOTION	▪ In-store and out-of-store shopper marketing
	▪ Single and cross-brand promotions
	▪ Item and shelf tagging
	▪ Storewide nutrition guidance systems and educational programs
	▪ Use of loyalty card feedback to guide healthier purchases
	▪ In-store product sampling

The Food Trust, and Robert Wood Johnson Foundation. *Harnessing the Power of Supermarkets to Help Reverse Childhood Obesity.*

Prior Reviews of Note

Glanz, K., Bader, M. D., & Iyer, S. (2012). Retail grocery store marketing strategies and obesity: An integrative review. *American Journal of Preventive Medicine*, 42(5), 503-512.

<https://doi.org/10.1016/j.amepre.2012.01.013>

Articles published between 1995 and 2010

125 primary peer-reviewed articles

Key findings:

- Several strategies for in-store marketing can promote healthful eating by increasing availability, affordability, prominence, and promotion of healthful foods and/or restricting or de-marketing unhealthy foods



Prior Reviews of Note

Escaron, A. L., Meinen, A. M., Nitzke, S. A., & Martinez-Donate, A. P. (2013). Supermarket and grocery store–based interventions to promote healthful food choices and eating practices: A systematic review. *Preventing Chronic Disease*, 10, E50. <https://doi.org/10.5888/pcd10.120156>

Articles published between 1978 and July 2012

58 peer-reviewed articles describing 33 interventions

Key findings:

- Promotion, advertising, and point-of-purchase information strategies were the most used strategies
- Limited evidence on the effect of the interventions on customer purchasing behavior
- Limited use of randomization in intervention designs, reflecting challenges to this design

Review Synthesis and Organization

Our findings are unique because they were synthesized and organized based on the following:

- **Intervention type:** single-component (manipulates one of the four Ps) or multi-component (manipulates more than one of the four Ps)
- **4Ps of marketing:** Product, placement, price, and promotion
- **Study design:** Experimental, quasi-experimental, pre-experimental, and time series

An emphasis is placed on the marketing techniques utilized in study interventions in order to determine which strategies have been found to be most and least effective using different research designs and outcome measures

Methods

Search Strategy

Methods to ensure a thorough and comprehensive literature review:

1. Created inclusion criteria
2. Created key search terms
3. Identified and searched appropriate databases
4. Conducted forward and backward searches



Inclusion Criteria

- Original empirical research, English, 2010 - 2019, and United States only
- Researcher or retailer initiated, inside the retail environment, and manipulated the retail environment
- Quantitative, mixed methods, and summative evaluations
- Must include at least one of the following outcomes:
 - *Purchasing-related* (e.g., objective store sales data, customer receipts, self-reported purchases or expenditures, or self-report intent to purchase)
 - *Consumption-related* (e.g., food frequency questionnaire, 24-h dietary recall, food diary, other self-reported diet/consumption, or self-report intent to eat)

Exclusion Criteria

Interventions were excluded if they:

- Were implemented by an entity other than a researcher or retailer (e.g., price intervention at the wholesale level or front-of-pack labels initiated by a food company);
- Did not occur inside the retail environment (e.g., restaurants, schools, mobile food trucks, online, and laboratory); or
- Did not manipulate the retail environment (e.g., grocery store tours).

Search Terms

Healthy food

("health* food*" OR "healthy eating" OR "fruit*" OR "vegetable*" OR "low* fat" OR "low* sodium" OR "low* sugar" OR "low-fat" OR "low-sodium" OR "low-sugar" OR "better for you" OR "nutritio*")

Study design

AND ("intervention" OR "pilot" OR "experiment*")

Setting

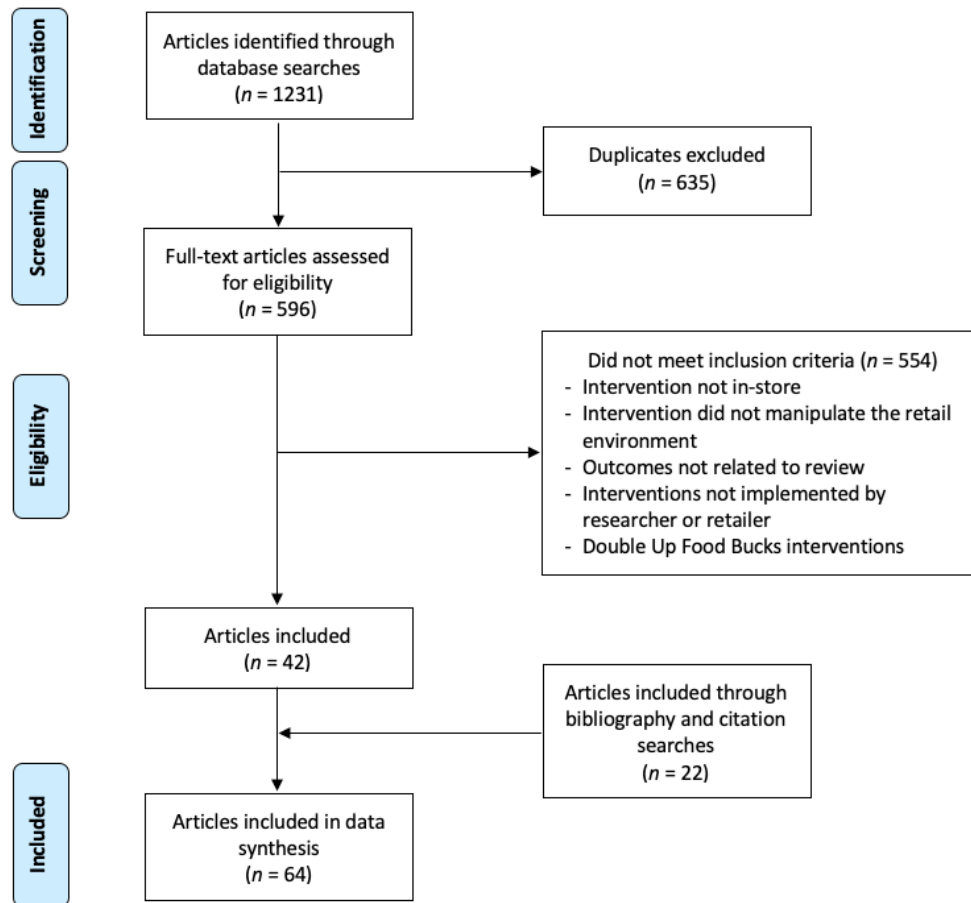
AND ("supermarket*" OR "grocery store*" OR "corner store*" OR "bodega*" OR "retail environment")

Databases

Searched nine databases from a variety of sectors (i.e., agriculture, business, communication, health, and psychology):

1. Academic OneFile
2. Business Source Premier
3. CAB Abstracts
4. Communication & Mass Media Complete
5. Family and Society Studies Worldwide
6. PsycINFO
7. PubMed
8. Sociological Abstracts
9. Web of Science

Procedure of Article Search



Results



Features of Included Articles

Research design:

- Experiment (35.4%)
- Pre-experiment (33.8%)
- Quasi-experiment (27.7%)
- Time series (3.1%)

Duration of intervention:

- Ranged from 22 minutes to 3.5 years

Setting:

- Supermarket (43.8%)
- Corner store (31.3%)
- Grocery store (26.6%)
- Other (12.5%)
- Convenience store (9.4%)
- Supercenter (3.1%)
- Trading post (3.1%)



Features of Included Articles: Outcome Measures

Purchasing-Related Measures:

- Objective store sales data (45.3%)
- Self-report purchases or expenditures (39.1%)
- Self-report intent to purchase (12.5%)
- Objective food purchasing data (9.4%)
- Customer receipts (7.8%)
- Self-report store sales (3.1%)

Consumption-Related Measures

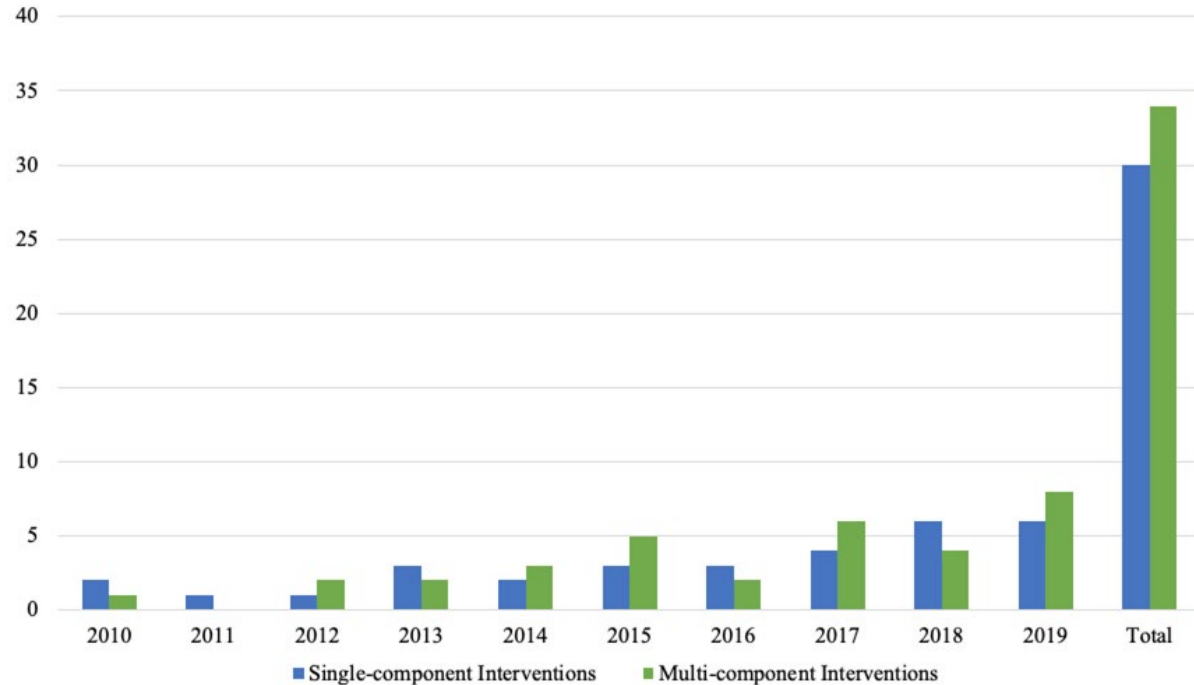
- Other self-report diet/consumption survey (18.8%)
- 24-hour dietary recall (4.7%)
- Food frequency questionnaire (3.1%)
- Veggie Meter or other biometrics (1.6%)
- Self-report intent to eat (1.6%)
- Food diary (0%)

Single- and Multi-Component Interventions

30 interventions were classified as single-component interventions

34 interventions were classified as multi-component interventions

Overall, the number of single- and multi-component interventions have increased each year from 2010 to 2019



Single-Component Interventions

Of the 30 single-component interventions:

- 23 manipulated Promotion
- 1 manipulated Product
- 1 manipulated Placement
- 3 manipulated Price
- 2 manipulated Other strategies
 - One examined the effects of ambient music and the other study analyzed effects of ambient scents



Single-Component Interventions: Effects

- At least 1 positive result was found in 27 of 30 single-component interventions
 - 13 had positive effects
 - 8 had mixed effects (positive + null + negative)
 - 5 had mixed effects (positive + null)
 - 2 had null effects
 - 1 had mixed effects (positive + negative)
 - 1 had negative effects

Multi-Component Interventions

Of the 34 multi-component interventions:

- 13 manipulated 2 Ps
 - 7 manipulated Promotion and Placement
 - 5 manipulated Promotion and Product
 - 1 manipulated Promotion and Price
- 20 manipulated 3 Ps
 - 15 manipulated Promotion, Product, and Placement
 - 3 manipulated Promotion, Product, and Price
 - 2 manipulated Promotion, Placement, and Price
- 1 manipulated 4 Ps



(<https://publicmattersgroup.com/projects/marketmakeoverseastlaboyلهheights/>)

Multi-Component Interventions: Effects

- At least 1 positive result was found in 29 of 34 multi-component interventions
 - 13 had mixed effects (positive + null)
 - 8 had positive effects
 - 7 had null effects
 - 4 had mixed effects (positive + null + negative)
 - 2 had mixed effects (positive + negative)

Discussion

Single- and Multi-Component Interventions

- Majority of interventions had at least 1 positive effect
- Promotion was the most utilized strategy for single-component interventions, and manipulating promotion, placement, and product was the most common strategy used for multi-component intervention
- Majority of studies used self-report surveys to collect data
- Only a few studies investigated the impact of a multi-component intervention in a layered approach so that the additive effect of each layer can be better understood
 - Future research should focus on understanding the layered effect

Limitations and Future Directions

- Need studies conducted with control groups, using store sales outcome data, and using rigorous dietary outcome measures
 - 24 out of the 63 studies (38%) were conducted without a control or comparison group
- Future research is needed to understand how increases in healthy food purchases do or do not serve to substitute for less healthy foods
 - E.g., increase in fruit sales associated with increase in low-fat dairy sales
- Future research should examine the extent to which interventions yield sustained effects
 - Less than 20% of studies examined impacts beyond three months and only 4.5% considered impacts beyond one year
- It is unclear how COVID-19 will continue to impact in-person food sales as compared to online sales and the extent to which product, promotion, and placement strategies can or will translate into online environments

Thank you!

Allison Karpyn, karpyn@udel.edu
Kathleen McCallops, kamcca@udel.edu